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REED SMITH LLP				
3110 FAIRVIEW PARK DRIVE				
FALLS CHURCH, VA 22042				
EXAMINER				
AHMED, SHEEBA				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/576,677

**Applicant(s)**

YAMAZAKI ET AL.

**Examiner**

SHEEBA AHMED

**Art Unit**

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF 298)  
Paper No(s)/Mail Date 11/17/06
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

## **DETAILED ACTION**

### ***Status of claims***

1. Claims 1-20 are pending and under consideration.

### ***Claim Objections***

2. Claims 1-20 are objected to because of the following informalities:

The claims contain awkward phrases. For example, claim 1 recites "a multi-layer film having a layer structure that a polyvalent metal compound-containing layer (B) adjoins one side or both sides of a polymer layer (A)....". Claim 2 recites "the multi-layer film according to claim 1, wherein the multi-layer film has a layer structure of the polymer layer (A)/the polyvalent metal compound-containing layer (B)....".

The claims are replete with terms which are not clear, concise and exact.

Appropriate correction is required for all claims.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 5-7, 10-16, 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Obha et al. (US 6,605,344).

Obha et al. disclose a gas-barrier film which is produced through applying a layer containing a metallic compound to a surface of a processed-polymer layer produced from a mixture of a polyalcohol and at least one poly(meth)acrylic polymer. The gas-barrier film exhibits excellent gas-barrier properties (see Abstract). There is also provided a gas-barrier film wherein the surface of the polymer layer to which the metallic-compound-containing layer is not applied is fixed onto a surface of a substrate. There is also provided a gas-barrier film wherein at least the polymer layer is subjected to heat treatment. There is also provided a gas-barrier film wherein the metallic compound is at least one species selected from the group consisting of magnesium oxide, calcium oxide, zinc oxide, magnesium hydroxide, calcium hydroxide, and zinc hydroxide. There is also provided a gas-barrier film wherein the metallic-compound-containing layer is produced from a mixture of the metallic compound and a resin.

In the disclosed film, a metallic-compound-containing layer is applied to the surface of a polymer layer formed from a mixture of a poly(meth)acrylic acid polymer and a polyalcohol, a metal invades the polymer layer from the metallic-compound-containing layer. The invasion of a metal can be confirmed by means of energy-dispersive X-ray spectroscopy (EDX). The existence ratio in the polymer layer (the number of counting of metallic atoms/the number of counting of oxygen atoms) is 0.1-20 at a position 0.1 micron deep in a polymer layer from the interface between the polymer layer and a layer containing a metallic compound solely or a layer of a mixture of metallic compound and resin.

The term "poly(meth)acrylic acid polymer" refers to acrylic acid polymers or methacrylic acid polymers containing two or more carboxyl groups, and to carboxylic acid polymers or partially neutralized carboxylic polymers. Specific examples of poly(meth)acrylic acids include a polyacrylic acid, a polymethacrylic acid, a copolymer of acrylic acid and methacrylic acid, and a mixture of two or more species thereof.

When a polymer layer is subjected to heat treatment for imparting water resistance and further enhanced gas-barrier properties to the product, in order to moderate the conditions of the treatment, a water-soluble metallic salt of inorganic or organic acid may appropriately be added to an aqueous solution of a mixture of the above polymers during preparation of the solution. A metal of the salt may be an alkali metal such as lithium, sodium, or potassium. Specific examples of metallic salts of inorganic or organic acid include lithium chloride, sodium chloride, potassium chloride, sodium bromide, sodium phosphite (sodium hypophosphite), disodium hydrogenphosphite, disodium phosphate, sodium ascorbate, sodium acetate, sodium benzoate, and sodium hyposulfite. A phosphine acid metallic salt (hypophosphorous acid metallic salt) which is at least one species selected from among phosphine acid metallic salts (hypophosphorous acid metallic salts) such as sodium phosphite (sodium hypophosphite) and calcium phosphite (calcium hypophosphite) is preferable. The amount of a metallic salt of inorganic or organic acid which is added is preferably 0.1-40 parts by weight on the basis of the solid content of a solution of a mixture of the polymers, more preferably 1-30 parts by weight.

A layer constituted solely by a metallic compound or a layer of a mixture of metallic compound and resin, serving as a metallic-compound-containing layer, is applied to the surface of a polymer layer which is fixed onto a substrate. Preferred examples of metals constituting a metallic compound include alkali metals such as lithium, sodium, calcium, rubidium, and cesium; alkaline earth metals such as beryllium, magnesium, calcium, strontium, and barium; and transition metals having an oxidation number of +2 such as zinc. Examples of metallic compounds which may be employed include metallic elements; inorganic salts such as oxides, hydroxides, halides, and carbonates; organic salts such as carboxylates and sulfonates; and polyacid salts such as poly(meth)acrylates. Of these, oxides, hydroxides, or carbonates of alkaline earth metal or transition metal having an oxidation number of +2 are preferable. More preferably, in consideration of handling and adhesion to a polymer layer, there is employed at least one metallic compound which is selected from among magnesium oxide, calcium oxide, magnesium hydroxide, calcium hydroxide, zinc oxide, zinc hydroxide, magnesium carbonate, and calcium carbonate. The method for application of a metallic-compound-containing layer is not particularly limited, so long as the layer is adjacent to a polymer layer (See Col. 2, lines 19-36; Col. 3, lines 27-37; Col. 7, lines 2-40; and Col. 10, lines 43-50).

With regards to the property limitations of claims 1, 5-7, 10-12, and 19, the Examiner takes the position that the peak ratio as determined by IR absorption spectrum, the elemental mole number ratio, the chemical equivalent of the metal compound, and the oxygen transmission rate as claimed must be identical in the gas

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barrier film disclosed in the above reference given that the structure and the chemical composition of the film as claimed and as disclosed in the reference is identical.

Furthermore, the structure disclosed by Obha et al. inherently results in the claimed gradient of the metal concentration in the polymer layer. All limitation of claims 1, 2, 5-7, 10-16, and 18-20 are either inherent or disclosed in the above reference.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3, 4, 8, 9, 17, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Obha et al. (US 6,605,344).

Obha et al., as discussed above, do not disclose the thickness of each layer and do not state that there can be multiple polymer and metal containing layers.

However, it would have been obvious to one having ordinary skill in the art to optimize the thickness of each layer given that the amount of the metal in the polymer layer can be controlled by the controlling the thickness of each layer. Furthermore, with regards to the additional layers, the Applicants are reminded that mere duplication of parts has no patentable significance unless a new and unexpected result is produced.

**Conclusion**

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHEEBA AHMED whose telephone number is (571)272-1504. The examiner can normally be reached on Monday-Friday from 8am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571)272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sheeba Ahmed/  
Primary Examiner, Art Unit 1794